Från medicinsk idé till verksam produkt.

Praktiska aspekter

Rare diseases & Orphan drugs

Hur skapar vi I Sverige läkemedel för patienter med sällsynta sjukdomar

17 februari 2005

Ola Flink, Karolinska Innovations

Availability of Orphan Medicinal Products

- 25-30 million Europeans affected
- 5000 -8000 rare diseases identified. Orphanet describes 3 600 rare diseases
- 19 pharmaceuticals approved as Orphan Medicinal Products
- 400-500 applications filed for classification as Orphan Medicinal Products (130 withdrawn)
- 60-70 marketed drugs are identified with potential efficacy in therapy for rare diseases (OrphanXchange)
- US approved orphan drugs not yet available in Europe (?)

Orphan Medicinal Products

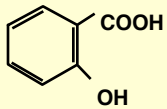
- Products intended to treat rare diseases
- Products marketed for other indications but may be used for treatment of rare diseases with or without any documentation
- Products withdrawn from the market but has a potential for the treatment of rare diseases

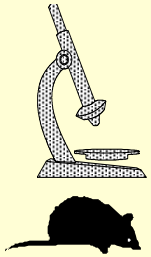
- Products not yet developed for economic or patent reasons

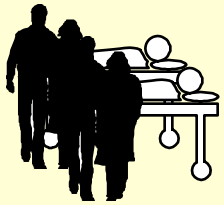
19 läkemedel har godkänts av EU (bl a tumör-, metabola och kardiovaskulära sjukdomar)

- Exempel
  - Glivec för kronisk myeloisk leukemi
  - Litak för hårcellsleukemi
  - Replagal och Fabrazym för Fabrys sjukdom
  - Aplidine (PharmaMar) –multipelt myelom
  - Alpha-1-antitrypsin för inhalation (BCG) - emfysem
  - Alpha-1-antitrypsin för inhalation (BCG) – cystisk fibros
  - Pifenidone (Uppsala Medical Information System)- idiopatisk pulmonell fibros
  - Valproensyra (G2M Cancer Drugs) fam. Adenomatös polyposi
  - N-(methyl-dicyclohexyl-benzylbenzamide)-azaphenyl-aminothiopyrrole (AB Science) - mastocytos

From idea to market authorization







Target Id → Chemistry /biomolecules
Search for active substances

Pharmacology
Efficacy studies in animal models, cells etc. Safety pharmacology, toxicology.

Authorities
Application to test the a new drug to humans (IND)

Phase I
Safety and tolerability studies on approximately 100 healthy volunteers

Phase II
Safety and efficacy-studies on a limited scale, approximately 200 patients

Phase III
Comparative studies on a large number of patients.
1500 - 5000 patients (NDA)

Authorities
Application for a market authorization fo a new drug

Phase IV
Continue comparative studies

Pre-clinical studies

Clinical studies

1	2	3	4	5	6	7	8	9	10 years

Clinical studies

Phase I	IND	• **Healthy volunteers** **- Safety, PK/PD**
Phase IIA		• **Patients, limited amount** **-Safety, PK/PD** **-Concept Test**
Phase IIB		• **Dose finding** • **Proof of concept**
Phase IIIA		• **Comparing studies for safety and efficacy documentation.** **Health Economy**
Phase IIIB	NDA	• **Studies in the same indication and dose as in NDA**
Phase IV	APPROVAL	• **Support of local marketing studies**

“Right dose to the right patient”

The patient

Illness

Interactions

Genetic differences

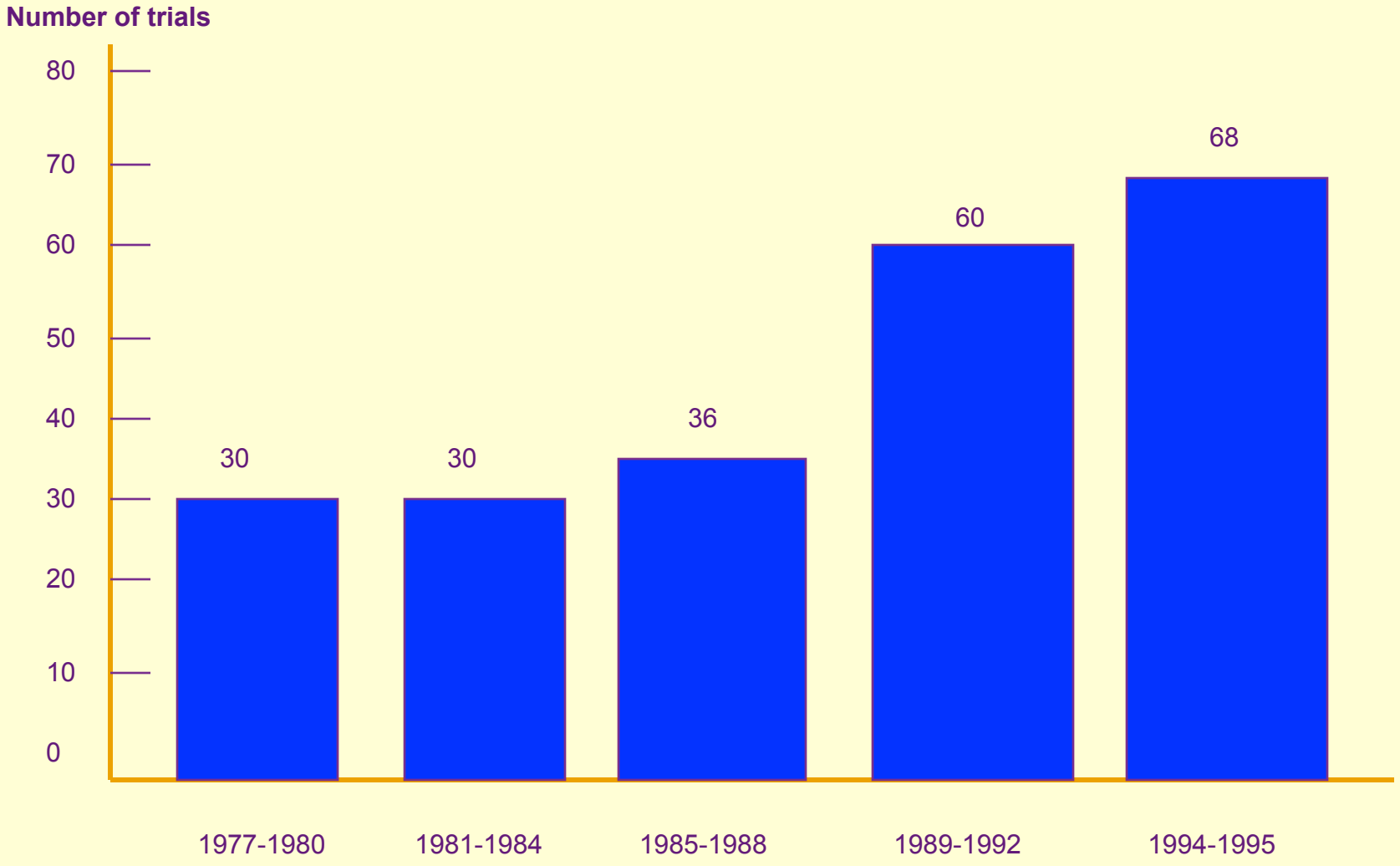
Men / Women

Younger / Elderly

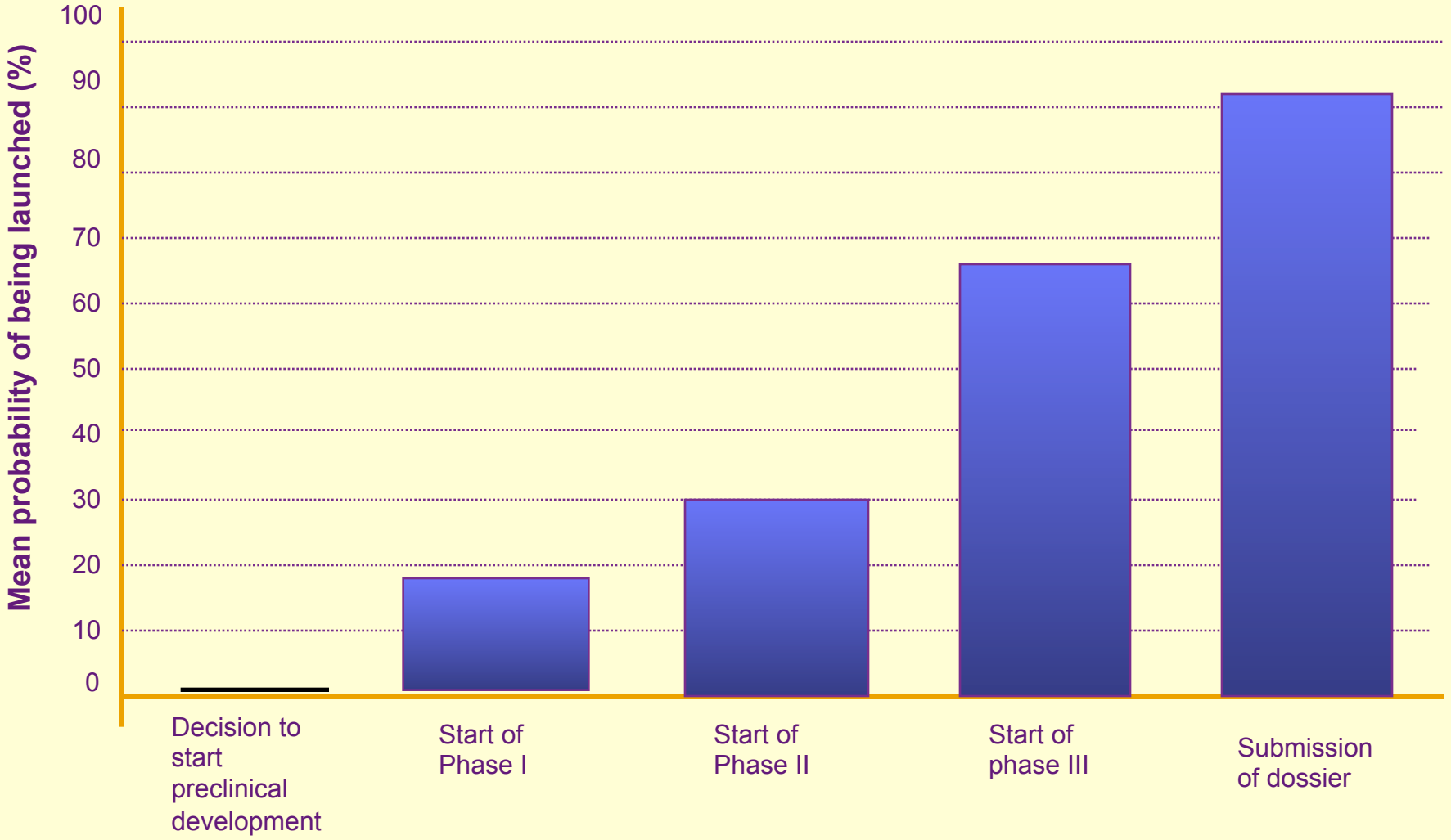
Impaired liver function

Impaired renal function

Average number of clinical trials per new drug application



800MSEK and 10-12 years of development
Success rates at different stages of R&D

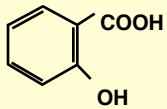


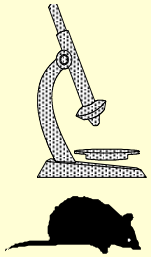
Särläkemedel

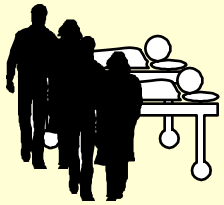
Vad kan KIs innovationsysten - Karolinska Enterprise -

bidraga med för utvecklingen av särläkemedel?

From idea to market authorization







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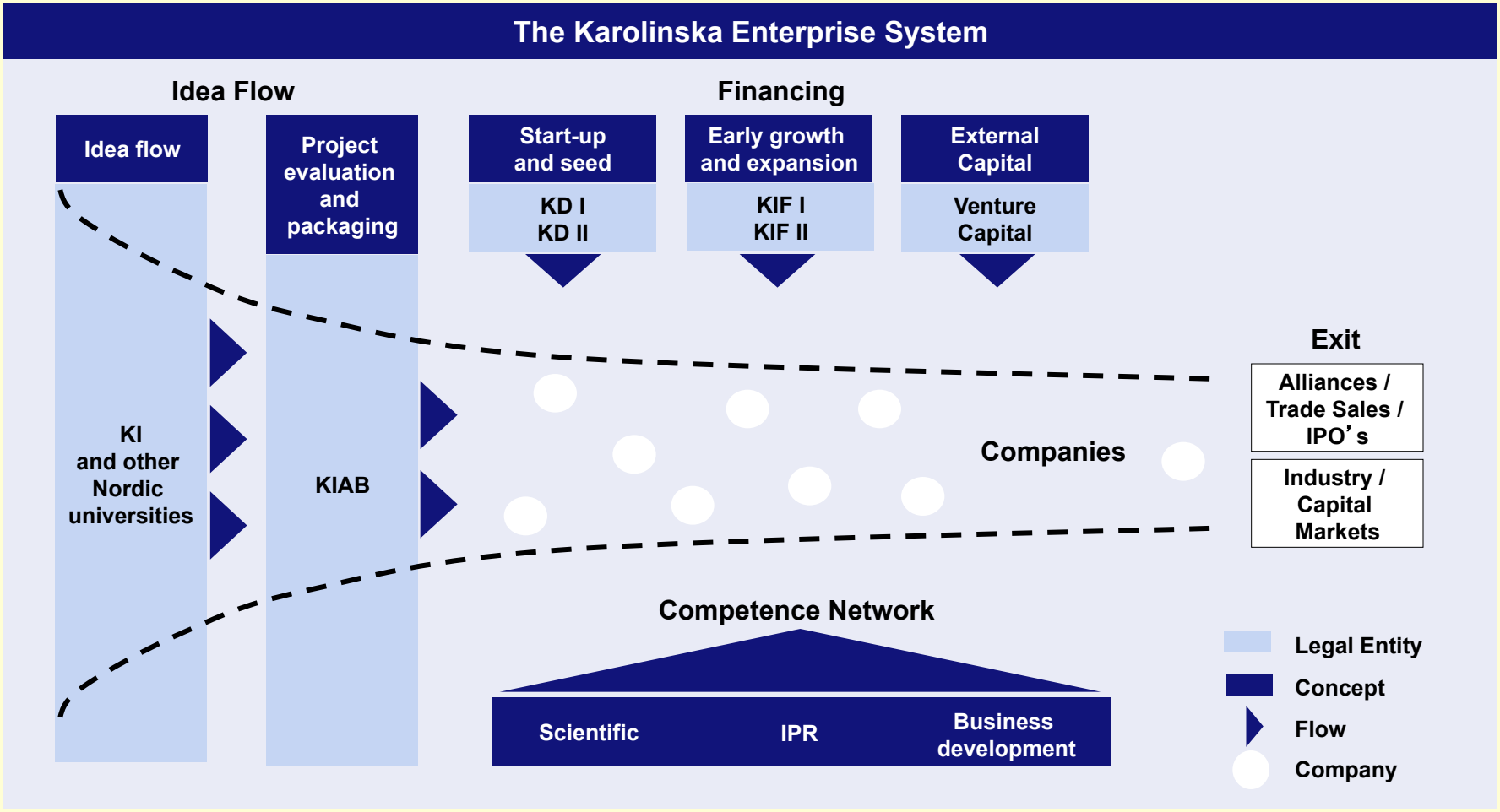
Karolinska Institutet has created a system for turning research results into applications

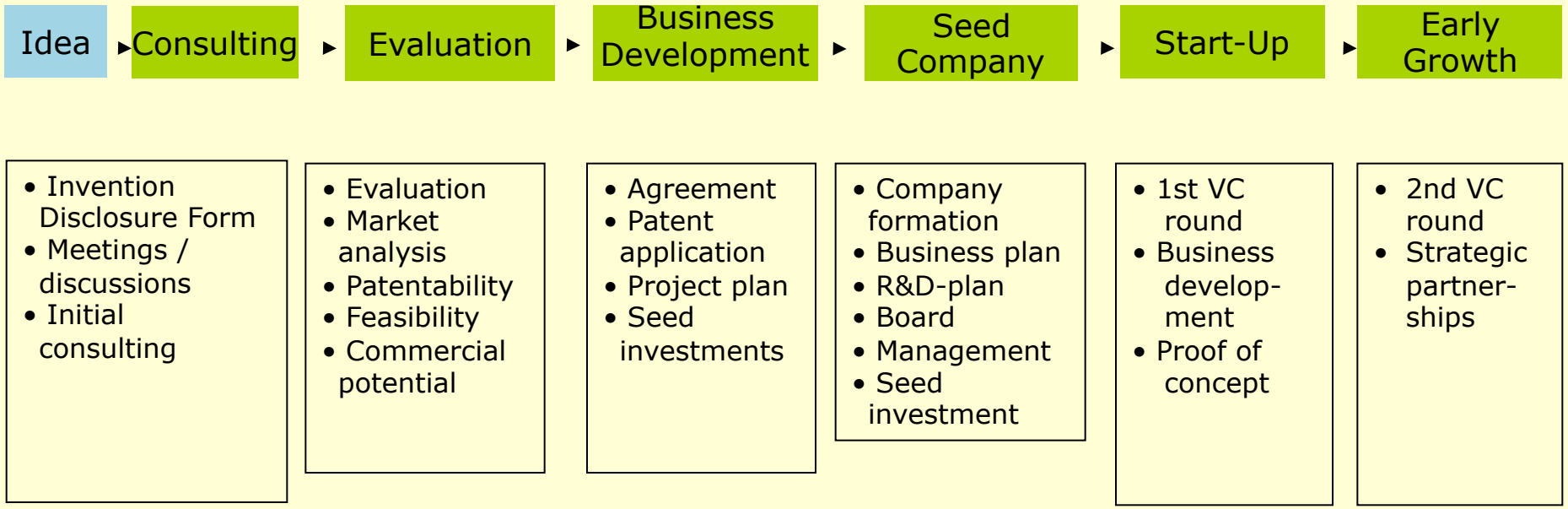
KAROLINSKA INSTITUTET
a medical university

- The organizations in the system focus on different strategic issues related to technology transfer and commercialisation.

Karolinska Enterprise



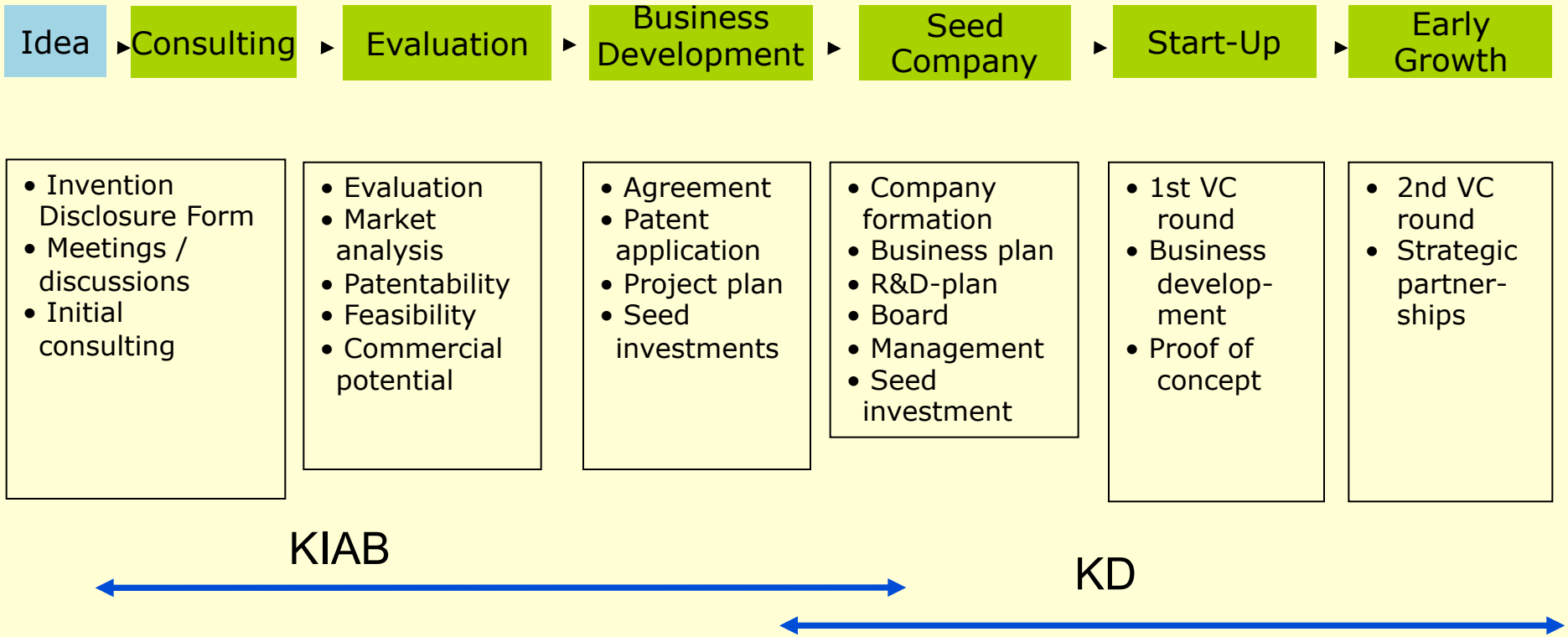
Advancing academic results into biotech companies



KIABs evaluation criteria

- Unique technology based on out-standing research
- Prerequisites for strong IPR protection
- Project with large international commercial potential
- Well-defined, measurable and controllable milestones
- Well-defined and realistic exit strategy

Advancing academic results into biotech companies



Research-incentives not in place in most European member states

- Incentives fo Orhan Medicinal Product Research in EU is on a individual country basis
- Only France and Netherlands seems too have introduced substantial incentives for Orphan Medicinal Products Research.
- Incentives exists in other countries but not specifically for Orphan Medicinal Products Research while others have not reported on any progress at all.
- Sixth Framework programme supports
- In Sweden no incentives exists for Orphan Medicinal Products Research
- In US the Orphan Drug Research incentives are nationwide and generous
- Incentives in EU also to support SMEs (80% of applications
- OrphanXchange platform for research projects

- Thank you!

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